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# Chapter 1

## Rubric

Component	Points
Part 1	
Test Cases	$2 \times 10$
Compilation	15
Total	35
Part 2	
Test Cases	$3 \times 15$
Compilation	20
Total	65
Total	100

# Chapter 2

## Metadata

### 2.1 Submitted Files

				handin.time	
1	01/27/2019	17:17:18	hvuong:	csce322assignment01part01.g4	- OK
2	01/27/2019	23:53:49	hvuong:	csce322assignment01part01.g4	- OK
3	01/28/2019	14:31:09	hvuong:	csce322assignment01part01.g4	- OK
4	01/29/2019	22:39:34	hvuong:	csce322assignment01part01.g4	- OK
5	01/30/2019	10:17:14	hvuong:	csce322assignment01part02error.java	- OK
6	01/30/2019	10:17:55	hvuong:	csce322assignment01part02.g4	- OK
7	01/30/2019	10:20:14	hvuong:	csce322assignment01part02.g4	- OK
8	01/30/2019	12:52:25	hvuong:	csce322assignment01part01.g4	- OK
9	01/30/2019	19:19:57	hvuong:	csce322assignment01part02.g4	- OK
10	01/30/2019	19:29:47	hvuong:	csce322assignment01part02.g4	- OK
11	01/30/2019	19:40:35	hvuong:	csce322assignment01part02.g4	- OK
12	01/30/2019	22:31:33	hvuong:	csce322assignment01part02.g4	- OK
13	01/30/2019	22:31:37	hvuong:	csce322assignment01part02error.java	- OK
14	01/30/2019	22:42:35	hvuong:	csce322assignment01part02.g4	- OK
15	01/30/2019	22:59:55	hvuong:	csce322assignment01part02.g4	- OK
16	01/30/2019	23:10:56	hvuong:	csce322assignment01part02.g4	- OK
17	01/31/2019	09:58:42	hvuong:	csce322assignment01part02.g4	- OK
18	01/31/2019	10:00:44	hvuong:	csce322assignment01part02.g4	- OK
19	02/01/2019	13:14:01	hvuong:	csce322assignment01part01.g4	- OK
20	02/01/2019	14:49:04	hvuong:	csce322assignment01part01.g4	- OK
21	02/01/2019	14:49:24	hvuong:	csce322assignment01part02.g4	- OK
22	02/01/2019	14:52:50	hvuong:	csce322assignment01part01.g4	- OK
23	02/01/2019	15:53:08	hvuong:	csce322assignment01part01.g4	- OK
24	02/01/2019	16:00:07	hvuong:	csce322assignment01part01.g4	- OK
25	02/01/2019	16:11:11	hvuong:	csce322assignment01part01.g4	- OK
26	02/01/2019	16:13:46	hvuong:	csce322assignment01part01.g4	- OK
27	02/06/2019	16:41:45	hvuong:	csce322assignment01part02.g4	- OK
28	02/06/2019	17:04:52	hvuong:	csce322assignment01part02.g4	- OK
29	02/06/2019	17:07:33	hvuong:	csce322assignment01part02.g4	- OK

### 2.2 webgrader Runs

				webgrader.time
1	2019-01-27T17:17:33-0600	10.43.1.202	hvuong	0001
2	2019-01-27T23:54:02-0600	76.84.219.52	hvuong	0001
3	2019-01-28T14:31:31-0600	10.43.1.202	hvuong	0001
4	2019-01-29T22:39:52-0600	10.43.1.202	hvuong	0001
5	2019-01-30T10:18:04-0600	10.43.1.202	hvuong	0001
6	2019-01-30T10:20:17-0600	10.43.1.202	hvuong	0001
7	2019-01-30T12:52:45-0600	10.43.1.202	hvuong	0001

8	2019-01-30T12:54:12-0600	10.43.1.202	hvuong	0001
9	2019-01-30T19:20:10-0600	10.43.1.202	hvuong	0001
10	2019-01-30T19:29:49-0600	10.43.1.202	hvuong	0001
11	2019-01-30T19:40:41-0600	10.43.1.202	hvuong	0001
12	2019-01-30T22:31:42-0600	76.84.219.52	hvuong	0001
13	2019-01-30T22:42:40-0600	76.84.219.52	hvuong	0001
14	2019-01-30T22:59:57-0600	76.84.219.52	hvuong	0001
15	2019-01-30T23:00:17-0600	76.84.219.52	hvuong	0001
16	2019-01-30T23:10:59-0600	76.84.219.52	hvuong	0001
17	2019-01-31T09:59:03-0600	10.43.1.202	hvuong	0001
18	2019-01-31T10:00:47-0600	10.43.1.202	hvuong	0001
19	2019-02-01T13:14:12-0600	10.43.1.202	hvuong	0001
20	2019-02-01T14:49:26-0600	10.43.1.202	hvuong	0001
21	2019-02-01T14:52:59-0600	10.43.1.202	hvuong	0001
22	2019-02-01T15:33:47-0600	10.43.1.202	hvuong	0001
23	2019-02-01T15:53:11-0600	10.43.1.202	hvuong	0001
24	2019-02-01T15:54:22-0600	10.43.1.202	hvuong	0001
25	2019-02-01T15:59:57-0600	10.43.1.202	hvuong	0001
26	2019-02-01T16:00:11-0600	10.43.1.202	hvuong	0001
27	2019-02-01T16:11:14-0600	10.43.1.202	hvuong	0001
28	2019-02-01T16:13:47-0600	10.43.1.202	hvuong	0001
29	2019-02-06T15:56:15-0600	10.43.1.202	hvuong	0001
30	2019-02-06T16:41:48-0600	10.43.1.202	hvuong	0001
31	2019-02-06T17:04:54-0600	10.43.1.202	hvuong	0001
32	2019-02-06T17:07:36-0600	10.43.1.202	hvuong	0001
33	2019-02-11T12:38:42-0600	10.43.1.202	hvuong	0001
34	2019-02-11T12:39:08-0600	10.43.1.202	hvuong	0001

## 2.3 diffs

submission.diffs

# Chapter 3

## csce322assignment01part01.g4

### 3.1 part01test01.cnf

### 3.1.1 Diff

part01test01.diff

### 3.1.2 Input File

part01test01.cnf

[illegible]

### 3.1.3 Submission Output

part01test01.output

```

Moves Section
Beginning of Section
Beginning of List
Number: 9
Number: 4
End of List
End of Section
Game Section
Beginning of Section
Start of Game

```



Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
SYNTAX PROBLEM ON LINE 8

### 3.1.4 Solution Output

part01test01.solution

Moves Section  
Beginning of Section  
Beginning of List  
Number: 9  
Number: 4  
End of List  
End of Section  
Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
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Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
SYNTAX PROBLEM ON LINE 8

### 3.1.5 Parse Tree

### 3.1.6 stderr

part01test01.err

## 3.2 part01test02.cnf

### 3.2.1 Diff

part01test02.diff

### 3.2.2 Input File

part01test02.cnf

```
game /*
[
1      2 -      3 |
2      3 - 1
]
*/
moves /*
{      3 -      2 -      7      -      3      -      7      -      3      -      1      -
      4      -      7      -      5      -      3      -      7      }
*/
```

### 3.2.3 Submission Output

part01test02.output

```
Game Section
Beginning of Section
Start of Game
Number: 1
Number: 2
Space: Empty
Number: 3
End of Row
Number: 2
Number: 3
Space: Empty
Number: 1
End of Game
End of Section
Moves Section
Beginning of Section
Beginning of List
Number: 3
Number: 2
Number: 7
Number: 3
Number: 7
Number: 3
Number: 1
Number: 4
Number: 7
Number: 5
Number: 3
Number: 7
End of List
End of Section
End of File
```

### 3.2.4 Solution Output

part01test02.solution

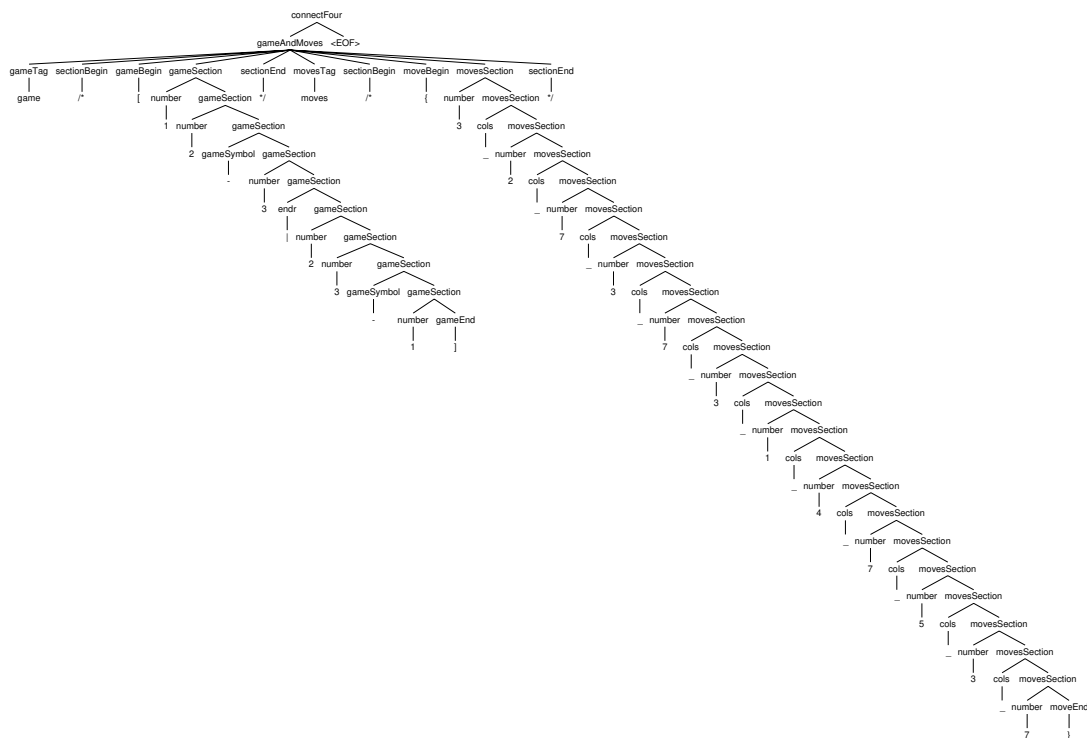
```
Game Section
Beginning of Section
Start of Game
Number: 1
Number: 2
Space: Empty
Number: 3
End of Row
Number: 2
```

```

Number: 3
Space: Empty
Number: 1
End of Game
End of Section
Moves Section
Beginning of Section
Beginning of List
Number: 3
Number: 2
Number: 7
Number: 3
Number: 7
Number: 3
Number: 1
Number: 4
Number: 7
Number: 5
Number: 3
Number: 7
End of List
End of Section
End of File

```

### 3.2.5 Parse Tree



### 3.2.6 stderr

part01test02.err

## 3.3 part01test03.cnf

### 3.3.1 Diff

part01test03.diff

### 3.3.2 Input File

part01test03.cnf

[illegible]

### 3.3.3 Submission Output

part01test03.output

[illegible]



Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
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Space: Empty  
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Space: Empty





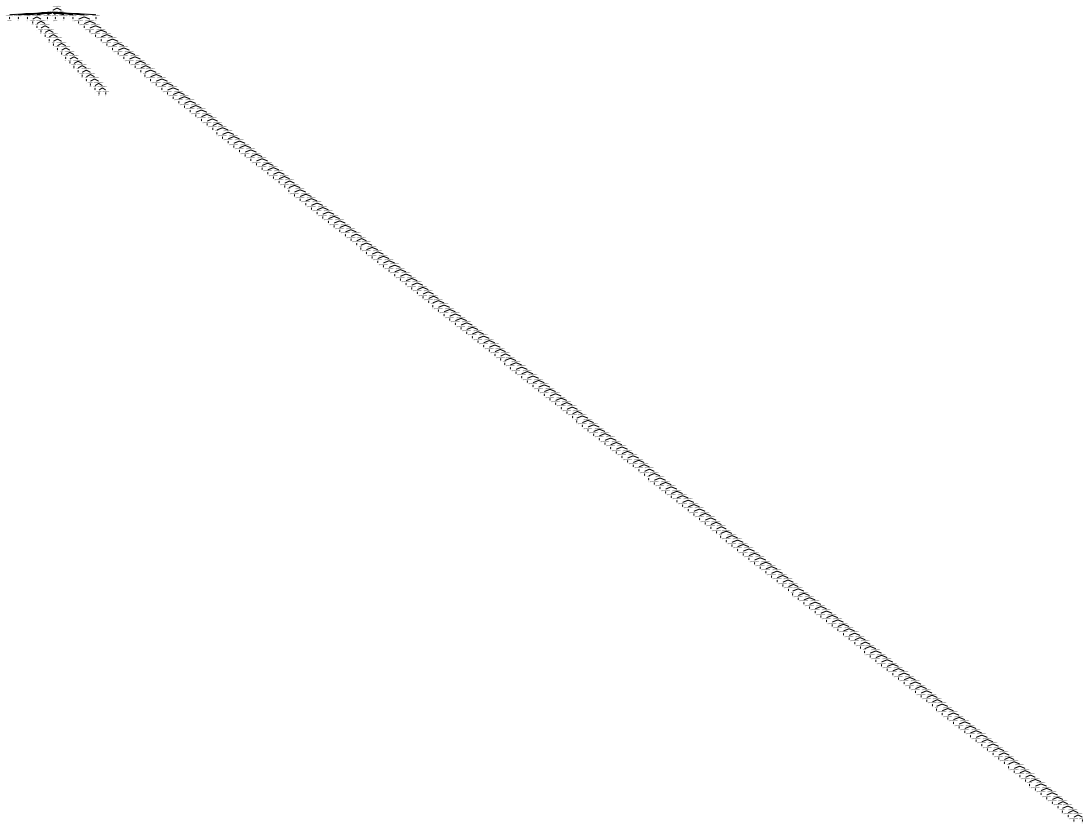


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End of Row  
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Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row

Space: Empty  
Space: Empty  
Space: Empty  
Number: 1  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 1  
Space: Empty  
Space: Empty  
End of Game  
End of Section  
End of File

### 3.3.5 Parse Tree



### 3.3.6 stderr

part01test03.err

## 3.4 part01test04.cnf

### 3.4.1 Diff

part01test04.diff

### 3.4.2 Input File

part01test04.cnf

game /\*

```

[
-   - |
-   - |
- -   |
- - |
- - |
-   - |
-   - |
-   - |
- -   |
2   1 |
2 1   |
2 1
]
*/
moves  /*
{ 2 - 1 - 1 - 5 - 2 - 3 - 2 -
3 - 4 }
*/

```

### 3.4.3 Submission Output

part01test04.output

```

Game Section
Beginning of Section
Start of Game
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
End of Row
Number: 2
Number: 1
End of Row
Number: 2
Number: 1
End of Row
Number: 2

```

Number: 1  
End of Game  
End of Section  
Moves Section  
Beginning of Section  
Beginning of List  
Number: 2  
Number: 1  
Number: 1  
Number: 5  
Number: 2  
Number: 3  
Number: 2  
Number: 3  
Number: 4  
End of List  
End of Section  
End of File

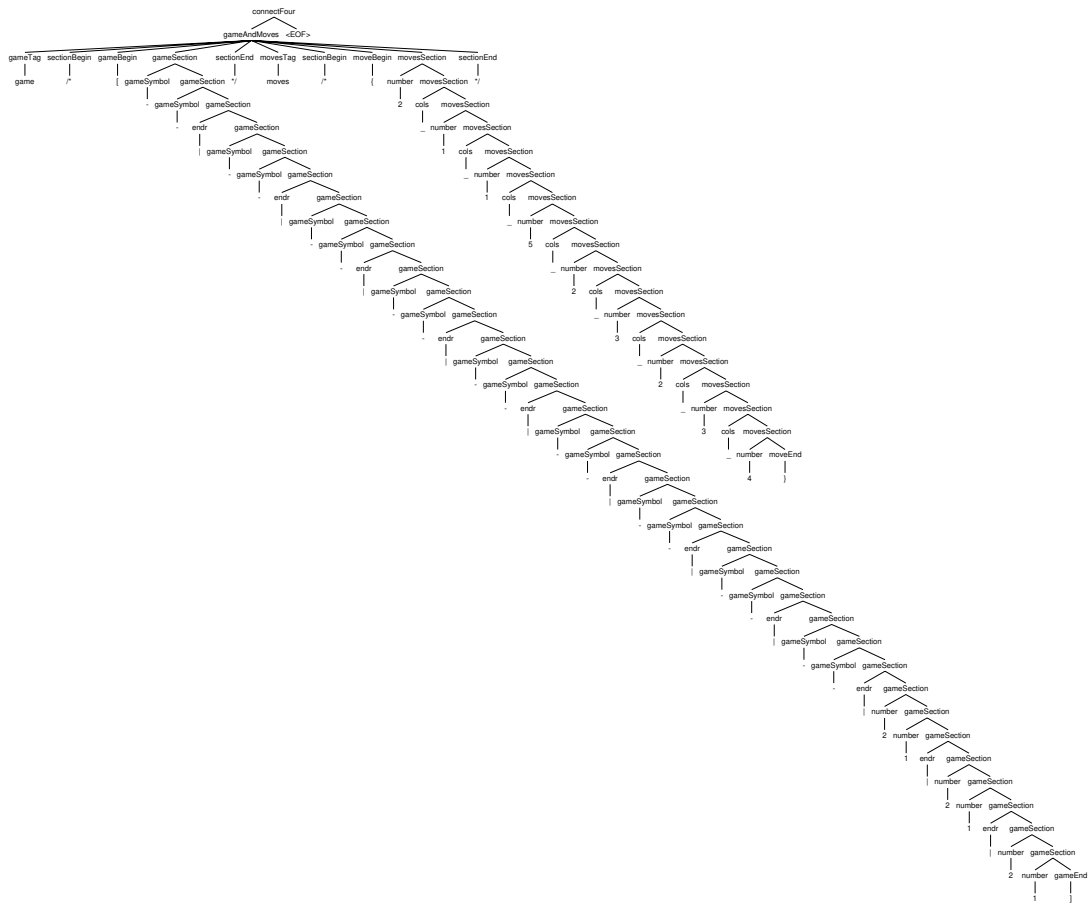
### 3.4.4 Solution Output

part01test04.solution

Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
End of Row  
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End of Row  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Number: 1  
End of Row  
Number: 2  
Number: 1  
End of Row  
Number: 2  
Number: 1

End of Game  
 End of Section  
 Moves Section  
 Beginning of Section  
 Beginning of List  
 Number: 2  
 Number: 1  
 Number: 1  
 Number: 5  
 Number: 2  
 Number: 3  
 Number: 2  
 Number: 3  
 Number: 4  
 End of List  
 End of Section  
 End of File

### 3.4.5 Parse Tree



### 3.4.6 stderr

part01test04.err

## 3.5 part01test05.cnf

### 3.5.1 Diff

part01test05.diff

### 3.5.2 Input File

part01test05.cnf

[illegible]

### 3.5.3 Submission Output

part01test05.output

[illegible]



End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty

Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 1  
Number: 3  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 2

Space: Empty  
End of Game  
End of Section  
End of File

### 3.5.4 Solution Output

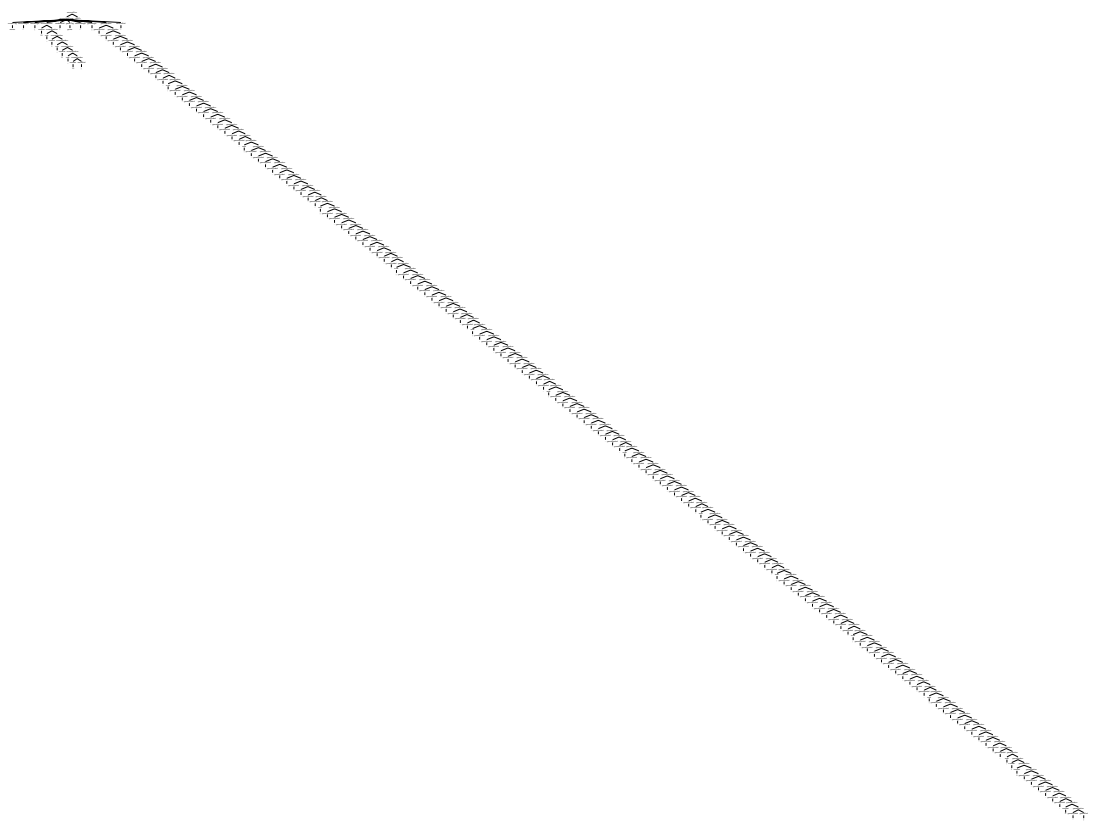
part01test05.solution

Moves Section  
Beginning of Section  
Beginning of List  
Number: 13  
Number: 1  
Number: 11  
Number: 13  
End of List  
End of Section  
Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty

Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty

Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 1  
Number: 3  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 2  
Space: Empty  
End of Game  
End of Section  
End of File

3.5.5 Parse Tree



3.5.6 stderr

part01test05.err

3.6 part01test06.cnf

3.6.1 Diff

part01test06.diff

3.6.2 Input File

part01test06.cnf

```
moves      /*
{          7 _    13 _    9      _    10      _    2 _    1 _    11
_          6 _    3      _    5 _    3 _    4      _    2
*/
game      /*
[
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- 2 - - - 1 2 3 4 - 3 - - 1 - |
]
*/
```

### 3.6.3 Submission Output

part01test06.output

[illegible]

Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 4  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Number: 2  
Space: Empty  
Number: 1  
Number: 2





End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 4  
Space: Empty

Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Number: 2  
Space: Empty  
Number: 1  
Number: 2  
Number: 3  
Number: 4  
Space: Empty  
Number: 3  
Space: Empty  
Space: Empty  
Number: 1  
End of Game  
End of Section  
End of File

### 3.6.5 Parse Tree



### 3.6.6 stderr

part01test06.err

## 3.7 part01test07.cnf

### 3.7.1 Diff

part01test07.diff

### 3.7.2 Input File

```

part01test07.cnf

moves /*
{      3      -      4      -      2      -      8      -      4      -      4      -      2      }
*/
game /*
[
-      -      -      -      -      -      -      |
-      -      -      -      -      -      -      |
-      -      -      -      -      -      -      |
-      -      -      -      -      -      -      |
-      -      -      -      -      -      -      |
2 -      -      -      -      -      -      |
2 1      -      1      -      -      -      -
]
*/

```

### 3.7.3 Submission Output

```

part01test07.output

Moves Section
Beginning of Section
Beginning of List
Number: 3
Number: 4
Number: 2
Number: 8
Number: 4
Number: 4
Number: 2
End of List
End of Section
Game Section
Beginning of Section
Start of Game
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
End of Row
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty

```

Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Number: 1  
Space: Empty  
Number: 1  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Game  
End of Section  
End of File

### 3.7.4 Solution Output

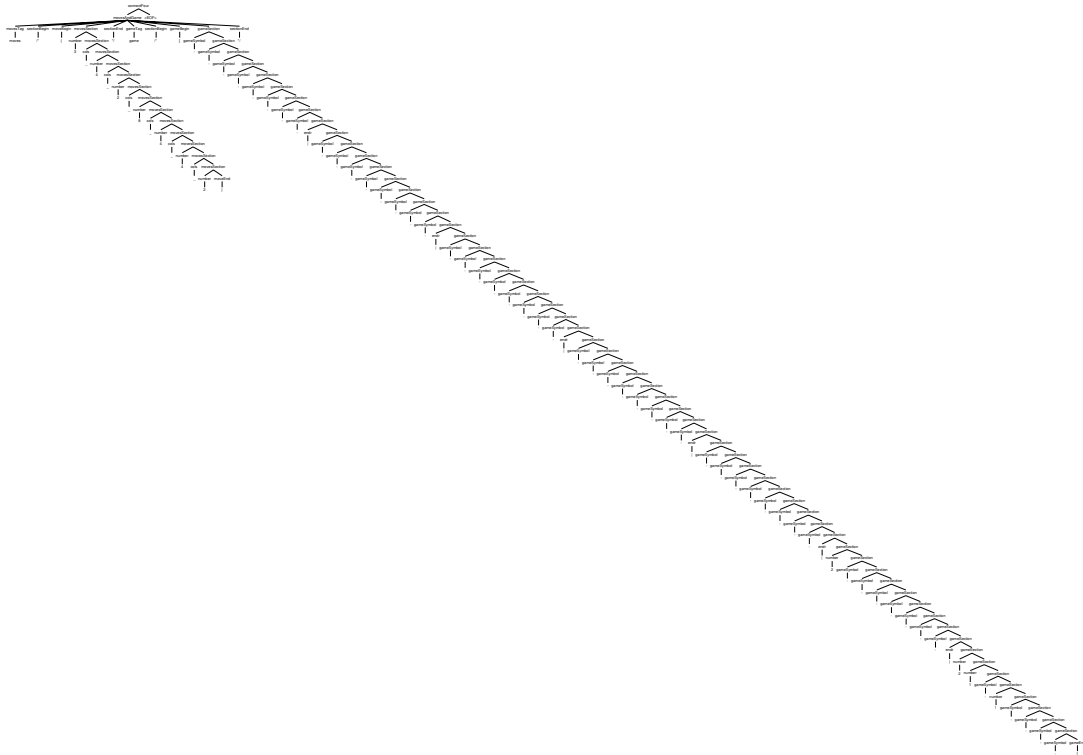
part01test07.solution

Moves Section  
Beginning of Section  
Beginning of List  
Number: 3  
Number: 4  
Number: 2  
Number: 8  
Number: 4  
Number: 4  
Number: 2  
End of List  
End of Section  
Game Section  
Beginning of Section  
Start of Game

Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Number: 1  
Space: Empty  
Number: 1  
Space: Empty  
Space: Empty

```
Space: Empty
Space: Empty
End of Game
End of Section
End of File
```

### 3.7.5 Parse Tree



### 3.7.6 stderr

part01test07.err

### 3.8 part01test08.cnf

### 3.8.1 Diff

part01test08.diff

### 3.8.2 Input File

part01test08.cnf

```
game /*  
[  
- - - - |  
- - - - |  
-   - - - |  
- - - - |  
-   - - - |  
- - - - |  
-   - - - |  
- - - - |  
- - - - |  
1 - - - |  
2   - 1 - |
```





Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Space: Empty  
Number: 1  
Space: Empty  
End of Row  
Number: 1  
Space: Empty  
Number: 2  
Space: Empty  
End of Game  
End of Section  
Moves Section  
Beginning of Section  
Beginning of List  
Number: 7  
Number: 2  
Number: 5  
Number: 7  
Number: 5  
End of List  
End of Section  
End of File

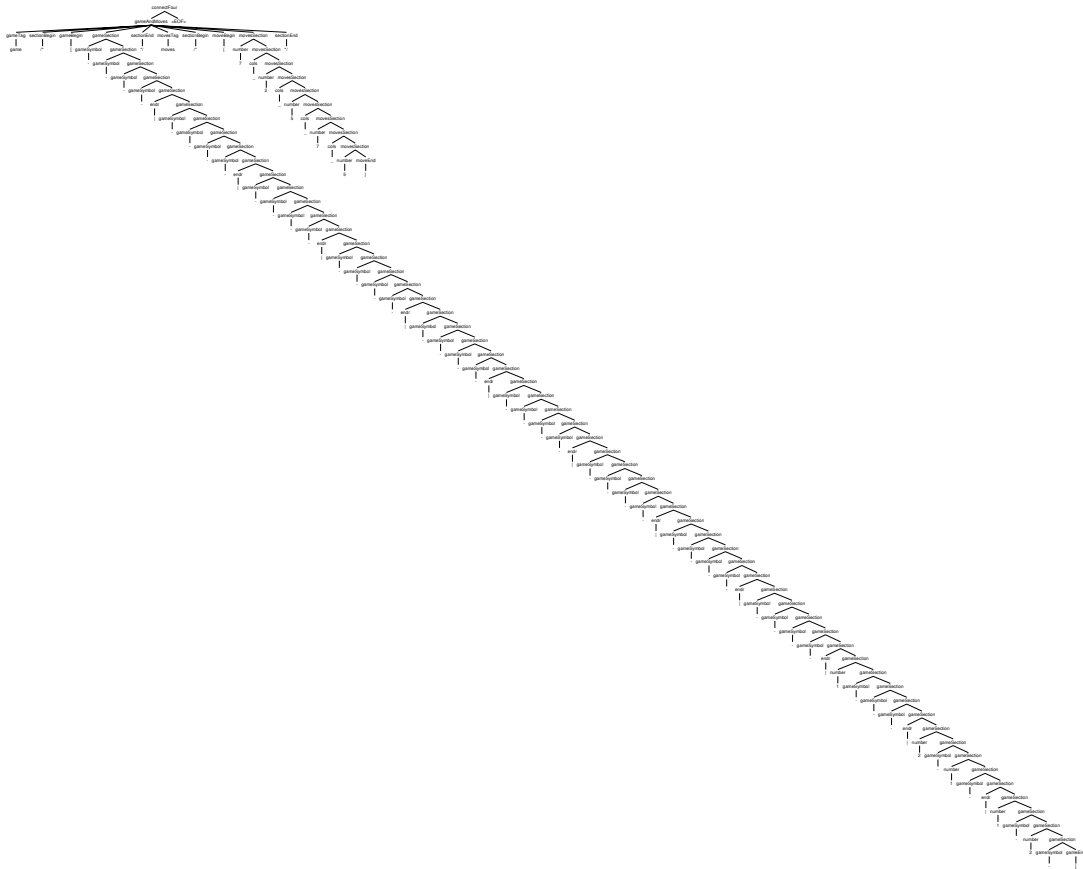
### 3.8.4 Solution Output

part01test08.solution

Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty

Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 1  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Space: Empty  
Number: 1  
Space: Empty  
End of Row  
Number: 1  
Space: Empty  
Number: 2  
Space: Empty  
End of Game  
End of Section  
Moves Section  
Beginning of Section  
Beginning of List  
Number: 7  
Number: 2  
Number: 5  
Number: 7  
Number: 5  
End of List  
End of Section  
End of File

### 3.8.5 Parse Tree



### 3.8.6 stderr

part01test08.err

### 3.9 part01test09.cnf

### 3.9.1 Diff

part01test09.diff

### 3.9.2 Input File

part01test09.cnf

```

moves /*
{ 6 _ 9 _ 12 _ 13 _ 4 _ 14 _ }
*/
game /*
[
- _ - - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - - - |
2 _ - - - - - - - - - - - - - - - |
1 - - 1 - - - - - - - - - - - - - - - |
]
*/

```

### 3.9.3 Submission Output

Moves Section  
Beginning of Section  
Beginning of List  
Number: 6  
Number: 9  
Number: 12  
Number: 13  
Number: 4  
Number: 14  
End of List  
End of Section  
Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 2  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Number: 1  
Space: Empty  
Space: Empty

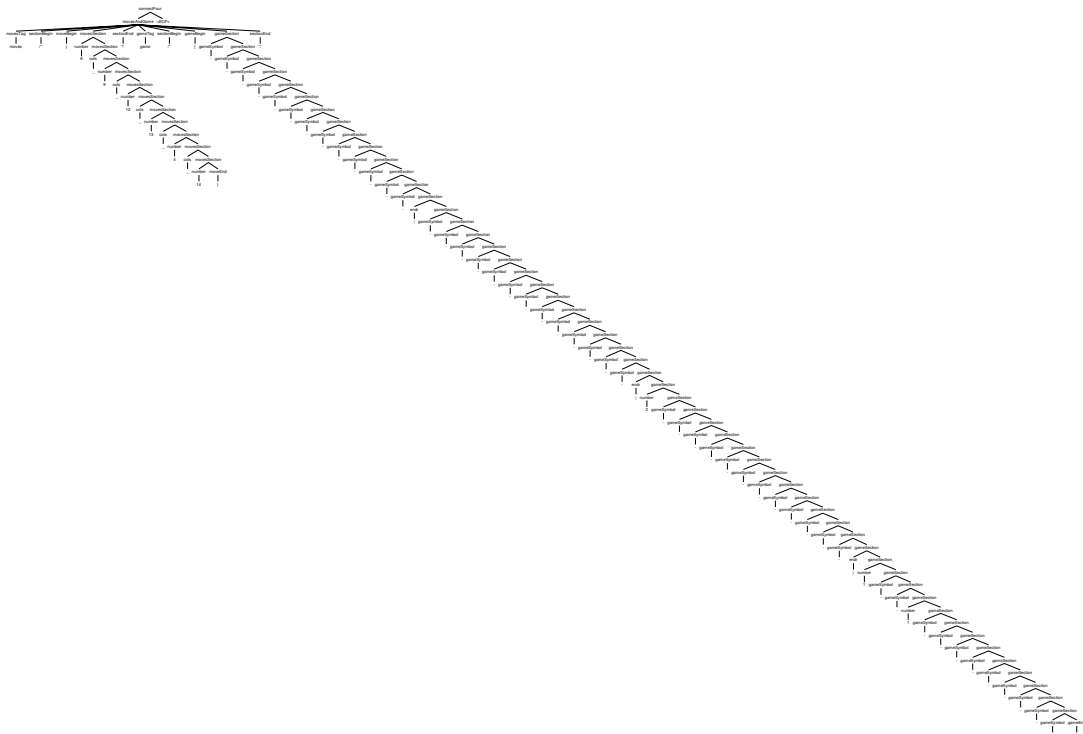


```

Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
End of Row
Number: 1
Space: Empty
Space: Empty
Number: 1
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
Space: Empty
End of Game
End of Section
End of File

```

### 3.9.5 Parse Tree



### 3.9.6 stderr

### 3.10.1 Diff

### 3.10.2 Input File

```

moves /*
{      9      }
*/
game      /*
[
-      - - - - -      - - - - -      |
- - - - -      -      - - - - -      - - - - -      |
- - -      -      - - -      -      - - -      - - -      |
-      -      - - -      -      - - - - -      -      -      |
- - -      - - -      - - -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      |
- - -      -      -      -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      |
- - -      -      -      -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      |
- - -      -      -      1      2      -      2      -      -      1      1      -
]
*/

```

### 3.10.3 Submission Output

```
Moves Section  
Beginning of Section  
Beginning of List  
Number: 9  
End of List  
End of Section  
Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty
```







Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 1  
Number: 2  
Space: Empty  
Number: 2  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 1  
Number: 1  
Space: Empty  
End of Game  
End of Section  
End of File

### 3.10.4 Solution Output

part01test10.solution

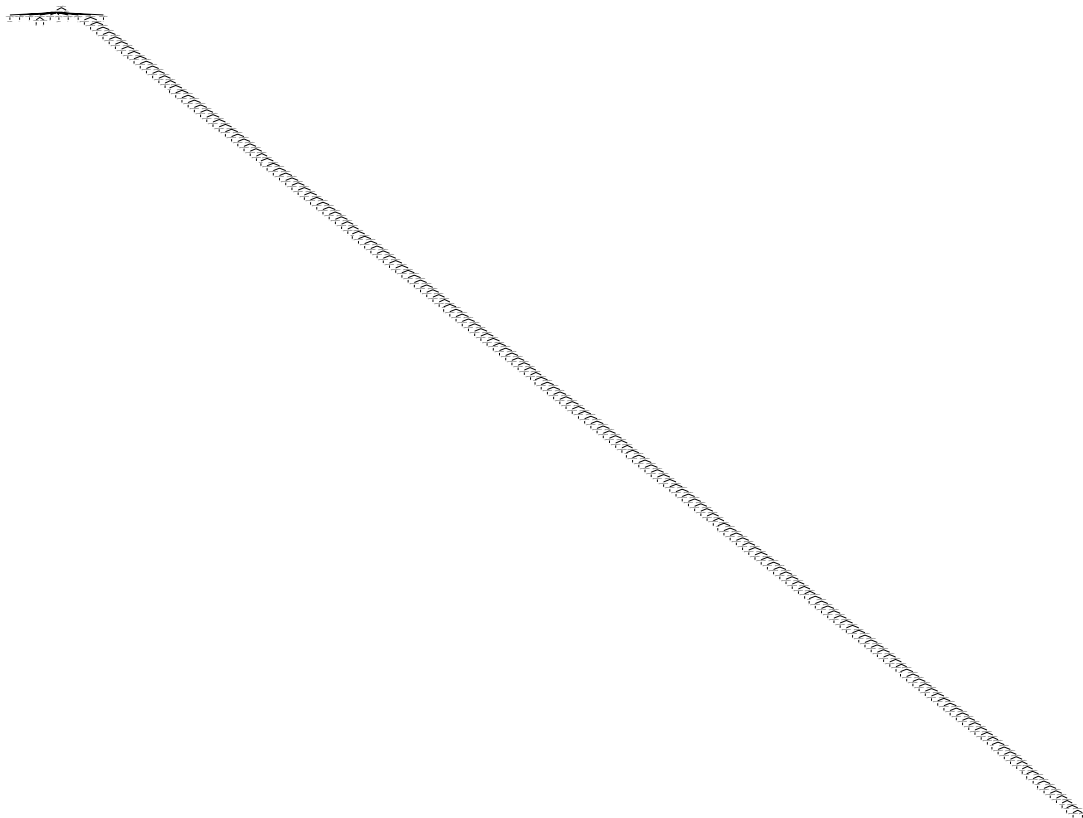
Moves Section  
Beginning of Section  
Beginning of List  
Number: 9  
End of List  
End of Section  
Game Section  
Beginning of Section  
Start of Game  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty



Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty

Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
End of Row  
Space: Empty  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 1  
Number: 2  
Space: Empty  
Number: 2  
Space: Empty  
Space: Empty  
Space: Empty  
Number: 1  
Number: 1  
Space: Empty  
End of Game  
End of Section  
End of File

### 3.10.5 Parse Tree



### 3.10.6 stderr

### 3.11 Source Code

csce322assignment01part01.g4

```

1 grammar csce322assignment01part01;
2
3 @header {
4     /*
5         * @author Huy Vuong
6         * This program find scan the connectFour file according to
7         * connectFour game rule
8         * A token recognition error will be raised and the program
9         * will be terminated if tokens syntax are wrong.
10        */
11 }
12 // rules
13 connectFour
14     : ( movesAndGame
15       | gameAndMoves )
16       ( err
17       | EOF { System.out.println("End of File"); } )
18       ;
19
20 // Sub rules
21 /*
22     Strat :  expr | error
23 */
24 moveEnd : MoveEnd { System.out.println("End of List"); } | err;
25 moveBegin : MoveBegin { System.out.println("Beginning of List"); } | err;
26 movesTag : MovesTag { System.out.println("Moves Section"); } | err;
27 gameTag : GameTag { System.out.println("Game Section"); } | err;
28 gameSymbol : GameSymbol { System.out.println("Space: Empty"); } | err;
29 sectionBegin : SectionBegin { System.out.println("Beginning of Section"); } | err;
30 endr : Endr { System.out.println("End of Row"); } | err;
31 sectionEnd : SectionEnd { System.out.println("End of Section"); } | err;
32 gameBegin : GameBegin { System.out.println("Start of Game"); } | err;
33 gameEnd : GameEnd { System.out.println("End of Game"); } | err;
34 err : ERR {System.out.println("SYNTAX PROBLEM ON LINE " + $ERR.line); System.exit(1);}
35 ;
36 // Numerical rules
37 number : NUMBER { System.out.println("Number: " + $NUMBER.text); };
38 // Find all tokens inside game and move section
39
40 movesSection : (number | cols) ( moveEnd | movesSection); // If not end of move,
41               recurse back
42 gameSection : (number | gameSymbol | endr)
43               (gameEnd | gameSection);
44
45 // file start with either moves-game or game-moves
46
47 movesAndGame : (movesTag sectionBegin moveBegin movesSection sectionEnd
48               gameTag sectionBegin gameBegin gameSection sectionEnd)
49               | err
50               ;
51 gameAndMoves : (gameTag sectionBegin gameBegin gameSection sectionEnd
52               movesTag sectionBegin moveBegin movesSection sectionEnd)
53               | err
54               ;

```

```

53
54
55 // tokens section
56 Cols : [_];
57 cols : Cols;
58 // Section title
59 MovesTag : 'moves';
60
61 GameTag : 'game';
62
63
64 // Numerical tokens
65 NUMBER : [0-9]+;
66 // Game symbol
67 GameSymbol : [-]+;
68
69 // Game row
70 Endr : '|' ;
71
72 // Section begining and ending
73 SectionBegin : '/*';
74 //      catch[RecognitionException e] { System.out.println("SYNTAX ERROR ON LINE " +
75      $ERR.line); System.exit(1); }
75 SectionEnd : '*/';
76 // Game Begining and Ending
77 GameBegin : '[' ;
78 GameEnd : ']' ;
79
80
81 // Moves begining and Ending
82 MoveBegin : '{';
83 MoveEnd : '}' ;
84 // Ignore space, tabs, newlines and extraneous char
85 WS : [ \t\n\r]+ { skip();};
86 ERR : .;

```

# Chapter 4

## csce322assignment01part02.g4

#### 4.1 part02test01.cnf

### 4.1.1 Diff

part02test01.withExtraCredit.diff

### 4.1.2 Input File

part02test01.cnf

```

moves /*
{      1      _      2      _      2      _      14 }
*/
game /*
[
-      -      -      _      -      -      -      -      -      -      -      |
-      _      _      _      -      -      _      _      _      -      -      -      |
-      -      _      _      -      -      _      -      -      -      -      -      |
-      _      -      -      -      -      -      -      -      -      -      -      |
-      -      -      _      -      -      -      _      -      -      -      -      |
-      _      -      -      _      -      -      -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      -      -      -      |
-      -      -      -      -      -      -      -      -      -      -      -      |
2      1      -      _      1      3      -      2      _      3      -      -      -
]
*/

```

### 4.1.3 Submission Output

part02test01.output

SEMANTIC	PROBLEM	2
SEMANTIC	PROBLEM	3
SEMANTIC	PROBLEM	4

#### 4.1.4 Solution Output

part02test01.solution.withExtraCredit

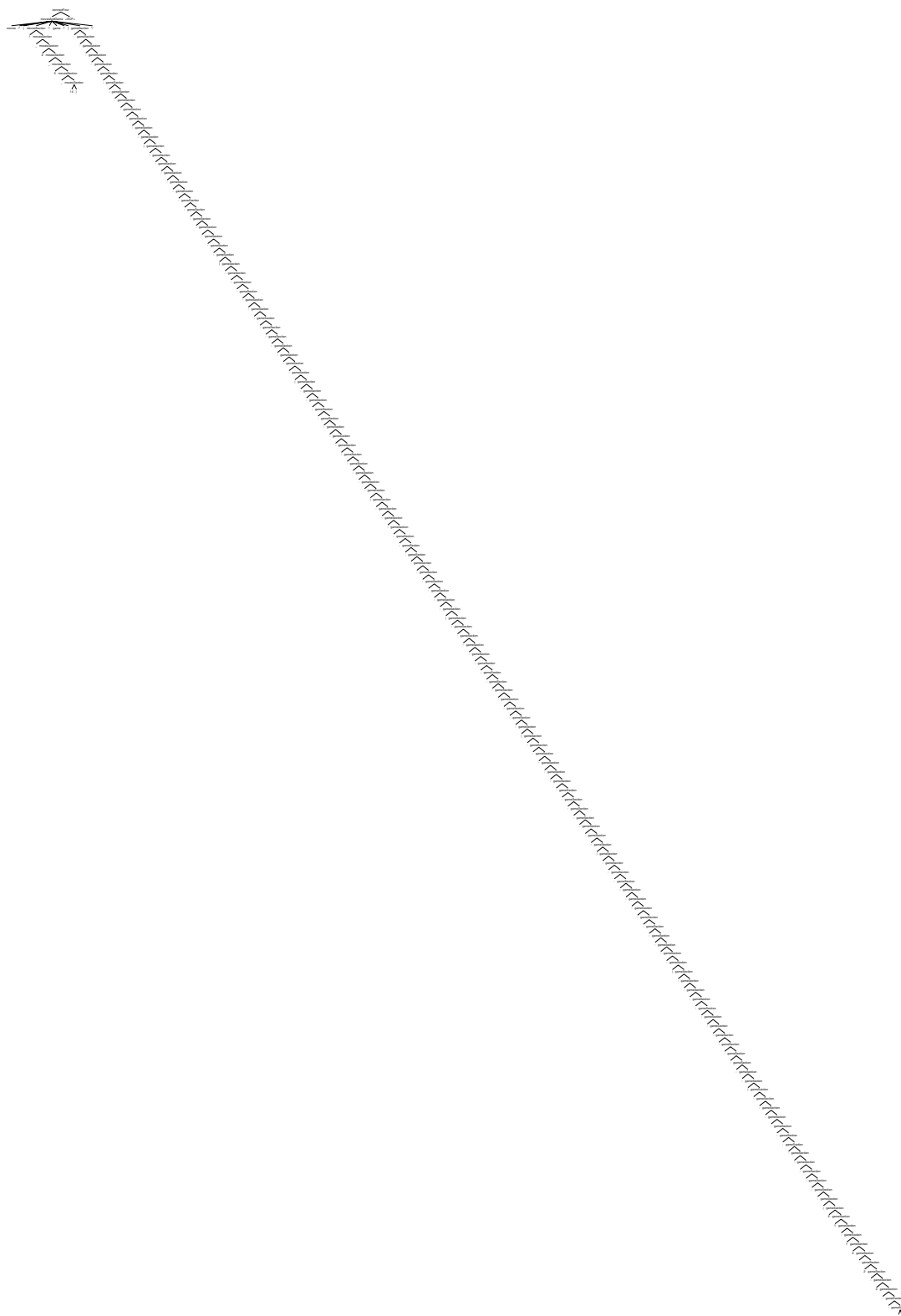
SEMANTIC	PROBLEM	2
SEMANTIC	PROBLEM	3
SEMANTIC	PROBLEM	4

part02test01.solution.withoutExtraCredit

SEMANTIC PROBLEM 2  
SEMANTIC PROBLEM 3



#### 4.1.5 Parse Tree



#### 4.1.6 stderr

part02test01.err

### 4.2 part02test02.cnf

#### 4.2.1 Diff

### 4.2.2 Input File

part02test02.cnf

```

moves      /*
{          7 _      2 _      1 _      2 _      9 _      4 _      2 _
    6      }
*/
game      /*
[
- - - - - |
- - - - - |
- - - - - |
- - - - - |
- - - - - |
- - - - 2 3 |
- - - - 3 4 |
4 - - - 1 4 |
2 1 2 - 1 3
]
*/

```

### 4.2.3 Submission Output

part02test02.output

SEMANTIC PROBLEM 4

### 4.2.4 Solution Output

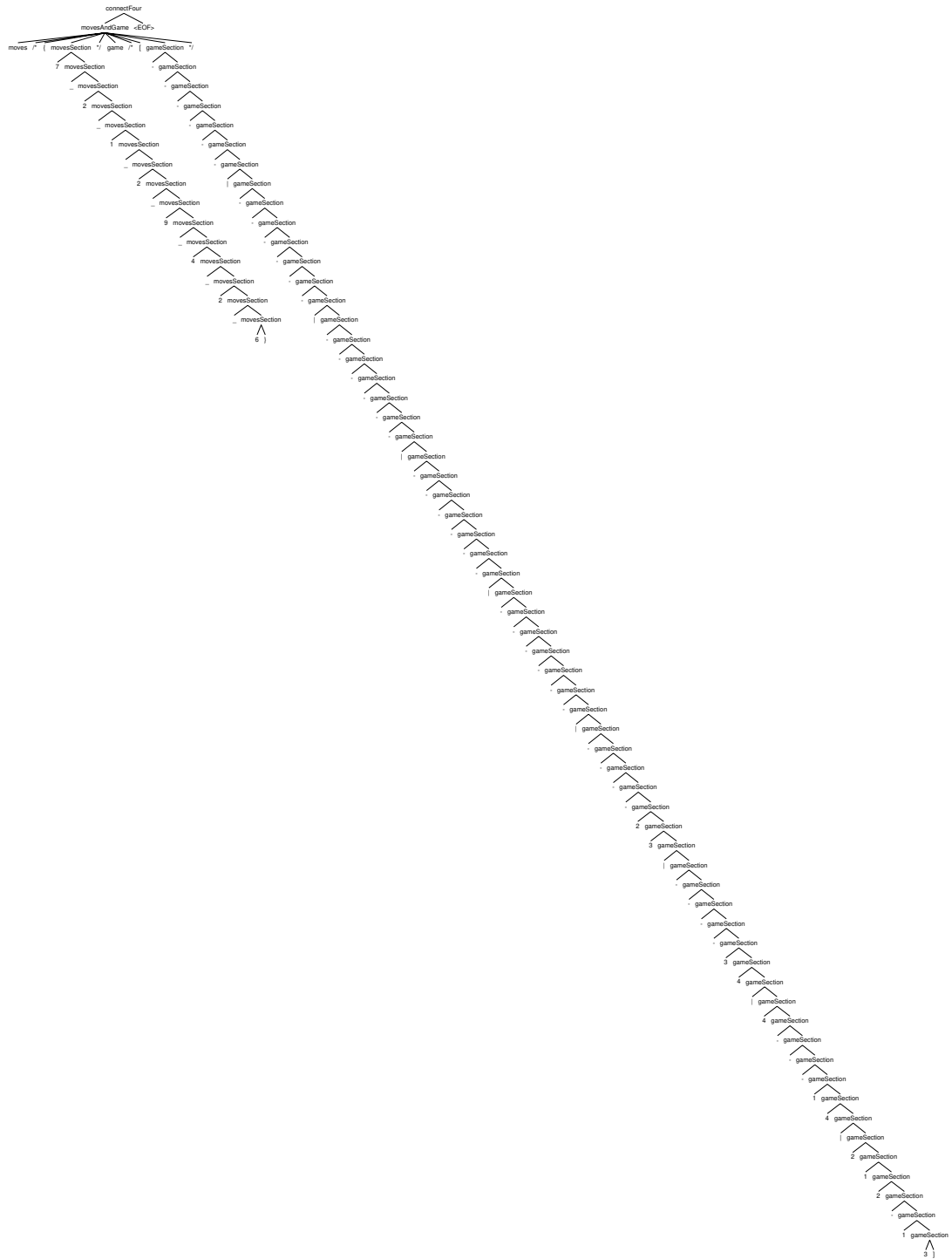
part02test02.solution.withExtraCredit

SEMANTIC PROBLEM 4

part02test02.solution.withoutExtraCredit

12 pieces have been played

### 4.2.5 Parse Tree



#### 4.2.6 stderr

part02test02.err

### 4.3 part02test03.cnf

### 4.3.1 Diff

part02test03.withoutExtraCredit.diff

### 4.3.2 Input File

part02test03.cnf

```
moves      /*
{          6  _      2  _      1  _      2  _      6  _      4  _      2  _
   6      }
*/
game      /*
[
-  -  -  -  -  -  |
-  -  -  -  -  -  |
-  -  -  -  -  -  |
-  -  -  -  -  -  |
-  -  -  -  -  -  |
-  -  -  -  2  3  |
-  -  -  -  3  4  |
4  -  -  -  1  4  |
2  1  2  -  1  3
]
*/
```

### 4.3.3 Submission Output

part02test03.output

12 pieces have been played

### 4.3.4 Solution Output

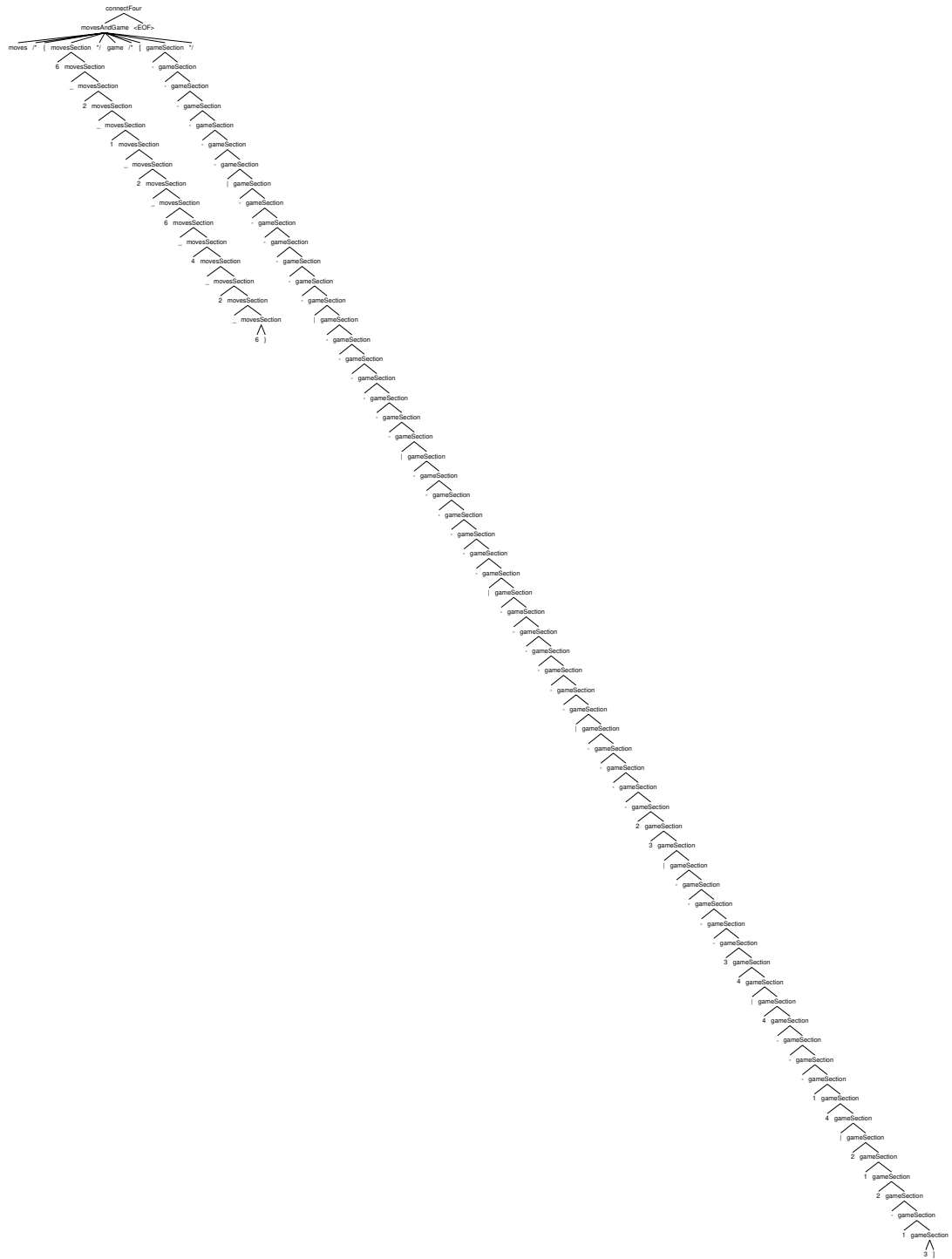
part02test03.solution.withExtraCredit

12 pieces have been played

part02test03.solution.withoutExtraCredit

12 pieces have been played

### 4.3.5 Parse Tree



### 4.3.6 stderr

part02test03.err

#### 4.4 part02test04.cnf

### 4.4.1 Diff

part02test04.withoutExtraCredit.diff

### 4.4.2 Input File

part02test04.cnf

[illegible]

### 4.4.3 Submission Output

part02test04.output

SYNTAX PROBLEM ON LINE 1

#### 4.4.4 Solution Output

part02test04.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 1

part02test04.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 1

#### 4.4.5 Parse Tree

#### 4.4.6 stderr

part02test04.err

### 4.5 part02test05.cnf

#### 4.5.1 Diff

part02test05.withExtraCredit.diff

#### 4.5.2 Input File

part02test05.cnf

[illegible]

### 4.5.3 Submission Output

part02test05.output

SEMANTIC PROBLEM 2  
SEMANTIC PROBLEM 3  
SEMANTIC PROBLEM 4

#### 4.5.4 Solution Output

part02test05.solution.withExtraCredit

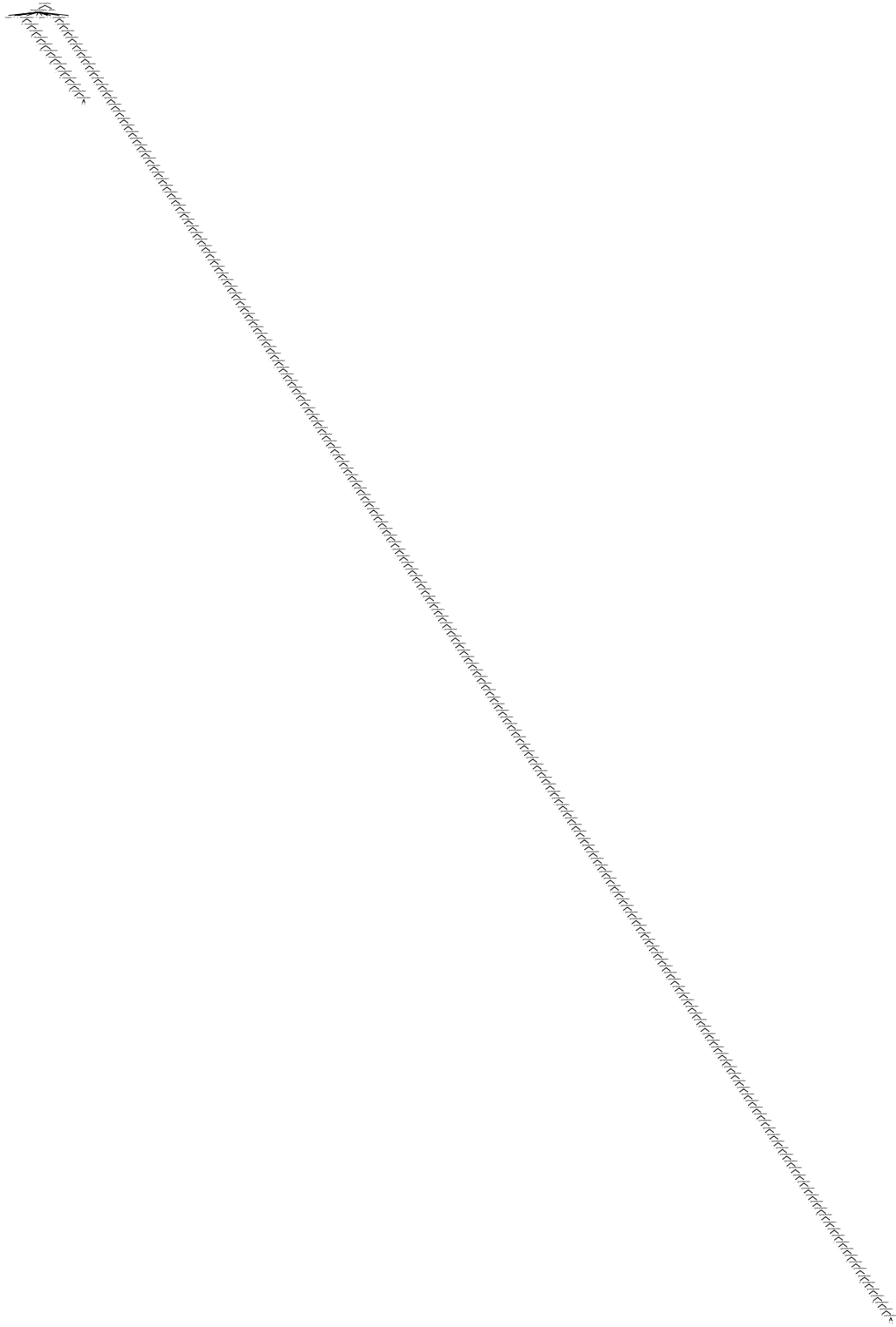
SEMANTIC	PROBLEM	2
SEMANTIC	PROBLEM	3
SEMANTIC	PROBLEM	4

part02test05.solution.withoutExtraCredit

SEMANTIC PROBLEM 2  
SEMANTIC PROBLEM 3



#### 4.5.5 Parse Tree



#### 4.5.6 stderr

part02test05.err

4.6 part02test06.cnf

4.6.1 Diff

part02test06.withoutExtraCredit.diff

4.6.2 Input File

```
part02test06.cnf

moves /*
{      3      -      3      -      12      -      6      -      2      -      18      -      10      -
      9      -      10      -      13      -      10      -      14      -      18      -      }
*/
game /*
[
- - - - - - - - - - - - - - - |
1 - - - - - - - - - - - - - - 1 - - - -
]
*/
```

4.6.3 Submission Output

part02test06.output

SYNTAX PROBLEM ON LINE 8

4.6.4 Solution Output

part02test06.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 8

part02test06.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 8

#### 4.6.5 Parse Tree

#### 4.6.6 stderr

part02test06.err

### 4.7 part02test07.cnf

#### 4.7.1 Diff

part02test07.withExtraCredit.diff

#### 4.7.2 Input File

part02test07.cnf

[illegible]

### 4.7.3 Submission Output

part02test07.output

SEMANTIC	PROBLEM	2
SEMANTIC	PROBLEM	3
SEMANTIC	PROBLEM	4

#### 4.7.4 Solution Output

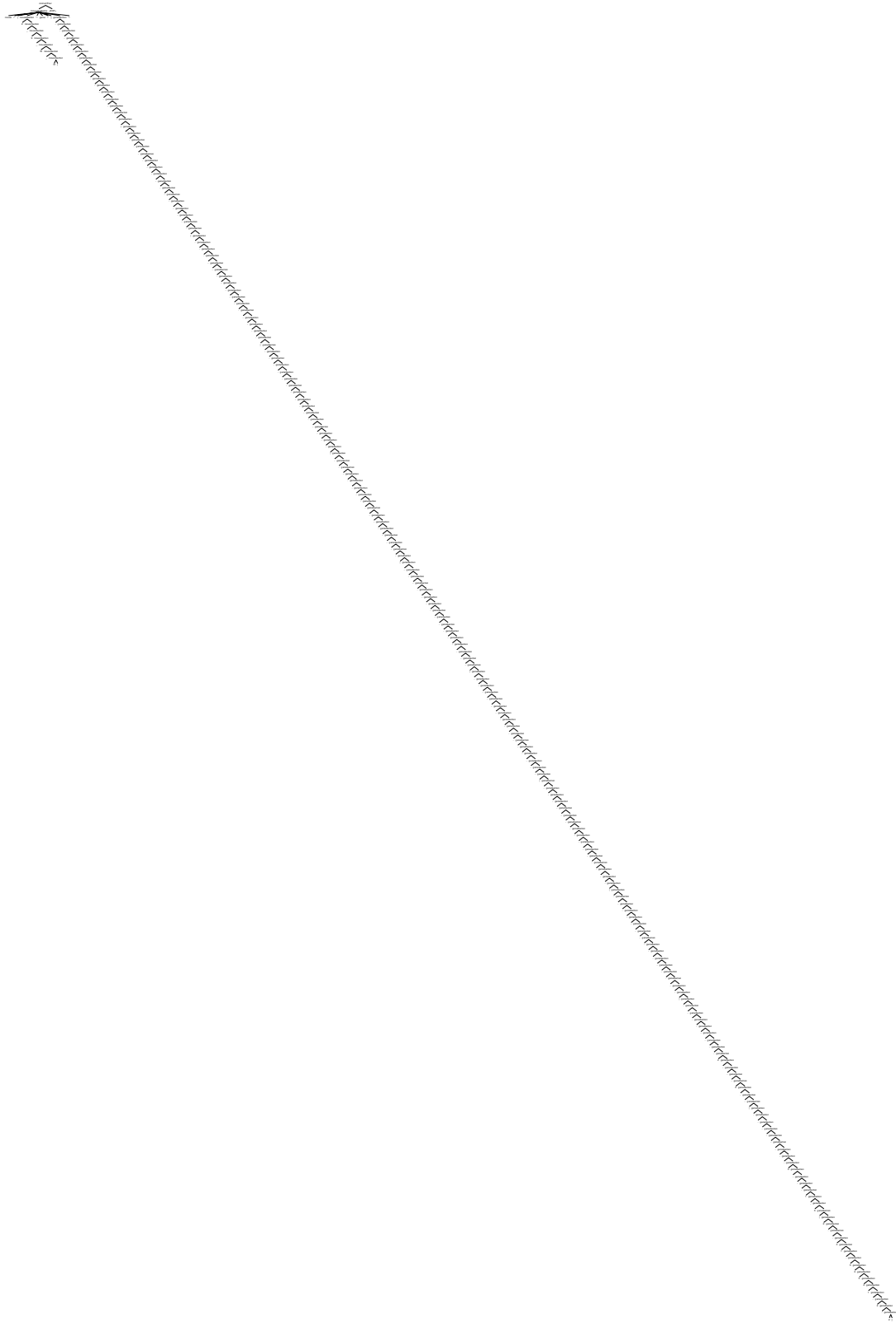
part02test07.solution.withExtraCredit

SEMANTIC PROBLEM 2  
SEMANTIC PROBLEM 3  
SEMANTIC PROBLEM 4

part02test07.solution.withoutExtraCredit

SEMANTIC PROBLEM 2  
SEMANTIC PROBLEM 3

#### 4.7.5 Parse Tree



#### 4.7.6 stderr

part02test07.err

4.8 part02test08.cnf

4.8.1 Diff

part02test08.withoutExtraCredit.diff

4.8.2 Input File

part02test08.cnf

```
game /*
[
-   -   -   -   -   -   -   -   |
-   -   -   -   -   -   -   -   |
-   -   -   -   -   -   -   -   |
- - -   -   -   -   -   -   -   |
-   -   -   -   -   -   -   -   - |
- 1     - -   - -   -   -   -
]
    */
moves /*
{      5      }
    */
```

4.8.3 Submission Output

part02test08.output

SYNTAX PROBLEM ON LINE 12

4.8.4 Solution Output

part02test08.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 12

part02test08.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 12

#### 4.8.5 Parse Tree

#### 4.8.6 stderr

part02test08.err

### 4.9 part02test09.cnf

#### 4.9.1 Diff

part02test09.withoutExtraCredit.diff

#### 4.9.2 Input File

```

board /*
<
- - - - - - - - - - #
- - - - - - - - - - |
- - - - - - - - - - #
- - - - - - - - - - \
- - - - - - - - - - #
- - - - - - - - - - #
- - - - - - - - - - \
- - - - - - - - - - #
- - - - - - - - - - \
- - - - - - - - - - |
- - - - - - - - - - #
- - - - - - - - - - \
- - - - - - - - - - |
1 - - - - - - - - 1
]
--!>
moves /*
{ 3 - 7 - 2 - 10 - 3 - 4 -
11 - 7 - 5 - 9 - 2 - 11 - 4 - 8 }
*/

```

### 4.9.3 Submission Output

SYNTAX PROBLEM ON LINE 1

### 4.9.4 Solution Output

SYNTAX PROBLEM ON LINE 1

SYNTAX PROBLEM ON LINE 1



#### 4.9.5 Parse Tree

#### 4.9.6 stderr

part02test09.err

#### 4.10 part02test10.cnf

##### 4.10.1 Diff

part02test10.withoutExtraCredit.diff

##### 4.10.2 Input File

part02test10.cnf

```
Columns <!--
  <!-- 492 - 49 - 57 = 52 - 53 = 56 - 50
    - 53 - 54 = 49 - 53 - 56 - 492 -
57 = 49 }
//
game /*
[
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- - - - - - - - - - - - - - - |
- 1 - - 1 - - 2 - - - 2 3
]
*/
```

4.10.3 Submission Output

part02test10.output

SYNTAX PROBLEM ON LINE 1

4.10.4 Solution Output

part02test10.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 1

part02test10.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 1

#### 4.10.5 Parse Tree

#### 4.10.6 stderr

part02test10.err

#### 4.11 part02test11.cnf

##### 4.11.1 Diff

part02test11.withExtraCredit.diff

##### 4.11.2 Input File

part02test11.cnf

```
moves      /*
  {        1    -    7    }
  */
game       /*
  [
- - - - - |
- - - - - - - |
- - - - - - - |
- - - - - - - |
- - - - - - - |
- - - - - - - |
- - - - - - - |
1 - - - - - |
1 1 - - - - -
  ]
  */
```

### 4.11.3 Submission Output

part02test11.output

```
SEMANTIC PROBLEM 1
SEMANTIC PROBLEM 4
```

### 4.11.4 Solution Output

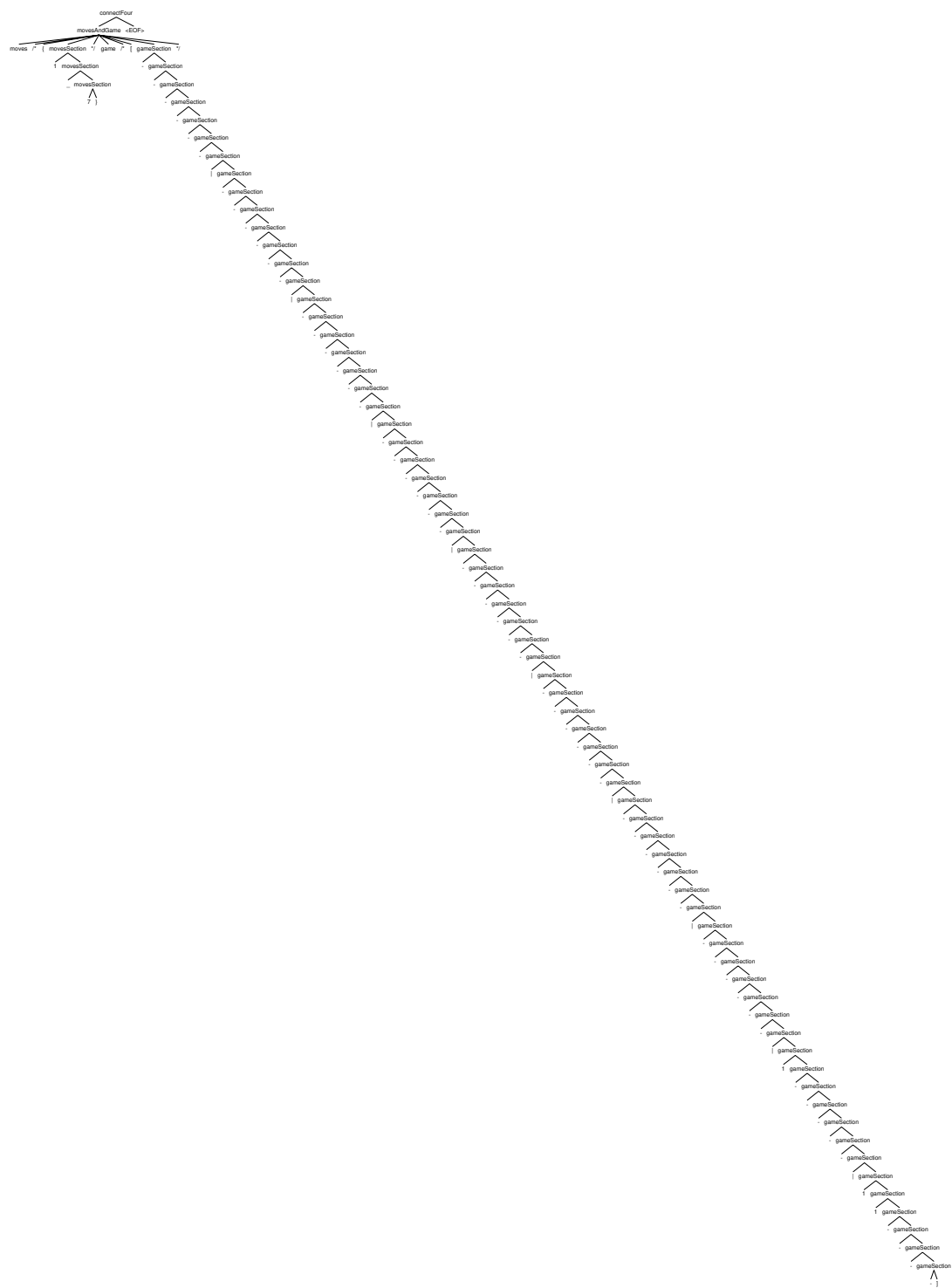
part02test11.solution.withExtraCredit

```
SEMANTIC PROBLEM 1
SEMANTIC PROBLEM 4
```

part02test11.solution.withoutExtraCredit

```
SEMANTIC PROBLEM 1
```

4.11.5 Parse Tree



4.11.6 stderr

part02test11.err

4.12 part02test12.cnf

4.12.1 Diff

part02test12.withoutExtraCredit.diff

### 4.12.2 Input File

part02test12.cnf

```
moves /*
{      1      -      3      -      7      -      9      -      8      -      5      }
*/
game /*
[
1      -      -      -      -      -      2      |
2      -      -      -      -      2      1      1
]
*/
```

### 4.12.3 Submission Output

part02test12.output

SYNTAX PROBLEM ON LINE 8

### 4.12.4 Solution Output

part02test12.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 8

part02test12.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 8

#### 4.12.5 Parse Tree

#### 4.12.6 stderr

part02test12.err

### 4.13 part02test13.cnf

#### 4.13.1 Diff

part02test13.withoutExtraCredit.diff

#### 4.13.2 Input File

part02test13.cnf

```
moves /*
{ 3 - 3 - 2 - 1 - 3 - 1 - 3 - 2
- 3 - 3 - 4 - 1 - }
*/
game /*
[
- |
- |
- |
- |
- |
- |
3 |
2 |
1 |
3 |
2 |
1 |
]
*/
```

#### 4.13.3 Submission Output

part02test13.output

SYNTAX PROBLEM ON LINE 6

#### 4.13.4 Solution Output

part02test13.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 6

part02test13.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 6



#### 4.13.5 Parse Tree

#### 4.13.6 stderr

part02test13.err

### 4.14 part02test14.cnf

#### 4.14.1 Diff

part02test14.withoutExtraCredit.diff

#### 4.14.2 Input File

part02test14.cnf

```
Game //
<
- - #
- - #
- - #
- - \
- - |
1 2 #
4 5 |
3 1 #
2 5 \
3 4 |
1 2
>
--!>
moves /*
{ 3 - 2 - 2 - 1 - 1 - 3 - 5 }
*/
```

#### 4.14.3 Submission Output

part02test14.output

SYNTAX PROBLEM ON LINE 1

#### 4.14.4 Solution Output

part02test14.solution.withExtraCredit

SYNTAX PROBLEM ON LINE 1

part02test14.solution.withoutExtraCredit

SYNTAX PROBLEM ON LINE 1

#### 4.14.5 Parse Tree

#### 4.14.6 stderr

part02test14.err

### 4.15 part02test15.cnf

#### 4.15.1 Diff

part02test15.withExtraCredit.diff

#### 4.15.2 Input File

part02test15.cnf

```
moves      /*
{          1      -      10      }
      */
game      /*
[
- - - - - |
- - - - - |
- - - - - |
- - - - - |
- - - - - |
- - - - - |
- - - - - |
1 - - - - - |
5 - - - - - |
4 - - - - - |
3 - - - - - |
1 - 2 - - - -
]
*/
```

### 4.15.3 Submission Output

part02test15.output

```
SEMANTIC PROBLEM 2
SEMANTIC PROBLEM 4
```

### 4.15.4 Solution Output

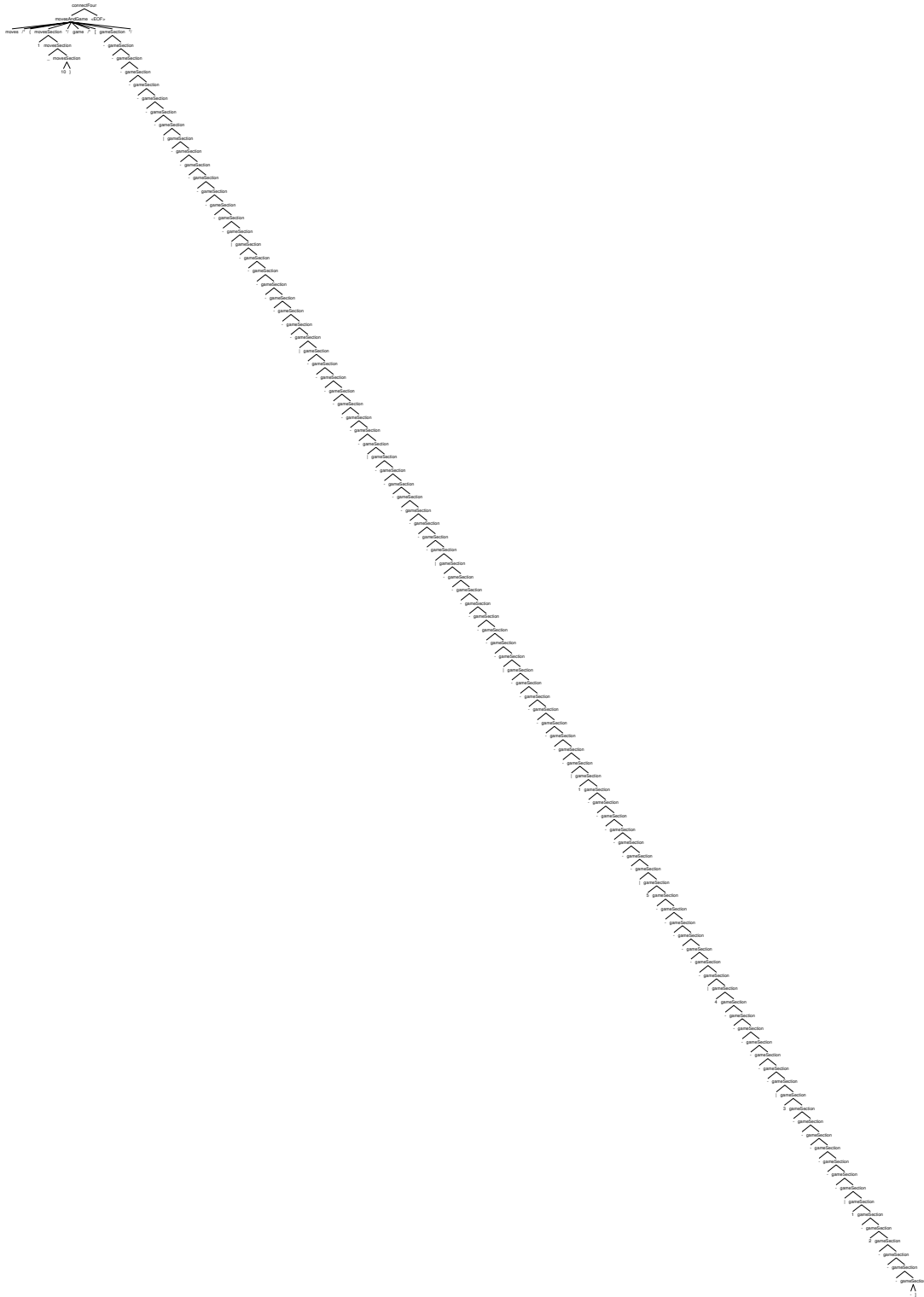
part02test15.solution.withExtraCredit

```
SEMANTIC PROBLEM 2
SEMANTIC PROBLEM 4
```

part02test15.solution.withoutExtraCredit

```
SEMANTIC PROBLEM 2
```

#### 4.15.5 Parse Tree



#### 4.15.6 stderr

part02test15.err

#### 4.16 Source Code

csce322assignment01part02error.java

```
1 import java.io.IOException;
```

```

2 import org.antlr.v4.runtime.*;
3
4 class csce322assignment01part02error extends BaseErrorListener{
5     @Override
6     public void syntaxError(Recognizer<?, ?> recognizer, Object offendingSymbol,
7         int line,
8             int position, String msg, RecognitionException e) {
9         // replace with code to process syntax errors
10        //System.err.println( msg );
11        System.err.println("SYNTAX ERROR ON LINE " + line);
12    }
13 }

```

csce322assignment01part02.g4

```

1 grammar csce322assignment01part02;
2
3 @header {
4     /*
5      * @author Huy Vuong
6      * This program find scan the connectFour file and find syntax and semantic
7      errors
8      * Input file structure will need to retain in order to find the semantic
9      erros.
10     * Tree walk order doesn't matter
11     */
12     import java.util.*;
13 }
14
15 @members {
16     Set<Integer> players = new HashSet<Integer>();
17     Set<String> seen = new HashSet<String>();
18     ArrayList<Integer> playerMoves = new ArrayList<Integer>();
19     ArrayList<Integer> allMoves = new ArrayList<Integer>();
20     int rowCount = 1;
21     int columnCount = 0;
22     int numCols;
23     int numMoves = 0;
24 }
25
26 // rules
27 connectFour
28 : (movesAndGame
29   | gameAndMoves
30   | err)
31 ( EOF {
32     boolean error = false;
33     System.out.println(rowCount + " " + columnCount);
34     if (players.size() < 2) {
35         System.out.println("SEMANTIC PROBLEM 1 ");
36         error = true;
37     }
38     if (rowCount > 10 || rowCount < 6) {
39         System.out.println("SEMANTIC PROBLEM 2 ");
40         error = true;
41     }
42     if (columnCount > 10 || columnCount < 6) {
43         System.out.println("SEMANTIC PROBLEM 3");
44         error = true;
45     }
46     // BONUS BONUS : checking if all moves are valid

```

```

44         // No test case for it apparently :|
45         for (int move : allMoves) {
46             if (move < 1 || move > numCols) {
47                 System.out.println("SEMANTIC PROBLEM 4");
48                 error = true;
49                 break;
50             }
51         }
52         if(!error) {
53             System.out.println(playerMoves.size() + " pieces have been
played");
54         }
55     }
56     | err)
57     ;
58
59 // Sub rules
60 moveEnd : MoveEnd;
61 moveBegin : MoveBegin;
62 movesTag : MovesTag;
63 gameTag : GameTag;
64 gameSymbol : GameSymbol;
65 sectionBegin : SectionBegin;
66 endr : Endr ;
67 sectionEnd : SectionEnd;
68 gameBegin : GameBegin ;
69 gameEnd : GameEnd ;
70 err : ERR {System.out.println("SYNTAX PROBLEM ON LINE " + $ERR.line); System.exit(1)
};
71 // Numerical rules
72 // Numerical rules
73 number : NUMBER ;
74 // Find all tokens inside game and move section using recursion
75 movesSection : (NUMBER { allMoves.add(Integer.parseInt($NUMBER.text)); numMoves += 1;
} | Cols )
76 (MoveEnd
77     { if (numMoves < 2) {
78         System.out.println("SYNTAX PROBLEM ON LINE " + $MoveEnd.line);
79         System.exit(1);
80     }
81     }
82     | movesSection);
83 gameSection : (NUMBER { players.add(Integer.parseInt($NUMBER.text)); playerMoves.add(
Integer.parseInt($NUMBER.text));
84     columnCount += 1; }
85     | GameSymbol { columnCount += 1; }
86     | Endr
87     { rowCount += 1;
88     numCols = columnCount;
89     if (columnCount < 4) {
90         System.out.println("SYNTAX PROBLEM ON LINE " + $Endr.line);
91         System.exit(1);
92     }
93     columnCount = 0;
94 } )
95 (GameEnd
96     { if (rowCount < 4 || columnCount < 4){
97         System.out.println("SYNTAX PROBLEM ON LINE " + $GameEnd.line);
98         System.exit(1);
99     }

```

```

100         }
101     }
102     | gameSection);
103
104 // file start with either moves-game or game-moves
105 movesAndGame :
106     MovesTag
107     { if (seen.contains("moves")) {
108         System.out.println("SYNTAX PROBLEM ON LINE " + $MovesTag.line)
109     ;
110         System.exit(1);
111     } else {
112         seen.add("moves");
113     }
114     SectionBegin MoveBegin movesSection SectionEnd
115     GameTag
116     { if (seen.contains("game")) {
117         System.out.println("SYNTAX PROBLEM ON LINE " + $MovesTag.line)
118     ;
119         System.exit(1);
120     } else {
121         seen.add("game");
122     }
123     }
124     SectionBegin GameBegin gameSection SectionEnd
125 ;
126 gameAndMoves :
127     GameTag
128     { if (seen.contains("game")) {
129         System.out.println("SYNTAX PROBLEM ON LINE " + $MovesTag.line)
130     ;
131         System.exit(1);
132     } else {
133         seen.add("game");
134     }
135     }
136     SectionBegin GameBegin gameSection SectionEnd
137     MovesTag
138     { if (seen.contains("moves")) {
139         System.out.println("SYNTAX PROBLEM ON LINE " + $MovesTag.line)
140     ;
141         System.exit(1);
142     } else {
143         seen.add("moves");
144     }
145     }
146     SectionBegin MoveBegin movesSection SectionEnd
147 ;
148 // tokens section
149 Cols : [_];
150 // Section title
151 MovesTag : 'moves';
152 GameTag : 'game';
153
154 // Numerical tokens
155 NUMBER : [0-9]+;

```



```

156 // Game symbol
157 GameSymbol : [-];
158
159 // Game row
160 Endr : '|';
161
162 // Section begining and ending
163 SectionBegin : '/*';
164 SectionEnd   : '*/';
165
166 // Game Begining and Ending
167 GameBegin : '[' ;
168 GameEnd   : ']' ;
169
170 // Moves begining and Ending
171 MoveBegin : '{' ;
172 MoveEnd   : '}' ;
173
174 // Ignore space, tabs, newlines and extraneous char
175 WS  : [ \t\n\r]+ -> skip;
176 ERR : .;

```